

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, TAKASHI ENAMI, a citizen of Japan residing at Kanagawa, Japan, KAZUNORI HOSHI, a citizen of Japan residing at Kanagawa, Japan, TAKAMASA HAYASHI, a citizen of Japan residing at Tokyo, Japan, YUJIN MORI, a citizen of Japan residing at Kanagawa, Japan, SHINGO SHIRAMURA a citizen of Japan residing at Kanagawa, Japan, YUUICHI MIKUNI, a citizen of Japan residing at Tokyo, Japan, HIDEJIROU MAEHARA, a citizen of Japan a residing at Kanagawa, Japan and YOSHIHIRO KUWABARA, a citizen of Japan residing at Saitama, Japan have invented certain new and useful improvements in

IMAGE FORMING SYSTEM THAT CAN OUTPUT DOCUMENTS
STORED IN REMOTE APPARATUS

of which the following is a specification:-

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a file transfer system, a file management server, a file transfer method, and a program for causing a computer to perform the file transfer method, an image forming system, a stored document management server, and an image forming apparatus.

The present invention more particularly relates to a file transfer system, a file management server, a file transfer method, and a program for causing a computer to perform the file transfer method in which a computer file is uploaded from a file transmission apparatus to the file management server, and the uploaded file is downloaded from the file management server to a file reception apparatus.

The present invention further particularly relates to an image forming system in which a stored document is uploaded from a first image forming apparatus to a stored document management server, and the uploaded stored document is downloaded from the stored document management server to a second image forming apparatus, and to the stored document management server and an image forming apparatus used for the image forming system.

2. Description of the Related Art

Recently, various techniques using a printer connected to the Internet are proposed.

Japanese Laid-open Patent Application No.

5 2001-232904, for example, proposes a system that outputs digital information acquired from the Internet using a mobile communication terminal such as a cellular phone. A cellular phone user requests a Web server for information. The Web server acquires
10 the requested information from an information server, and generates printer specific print control codes based on the acquired information. The Web server embeds the generated print control codes in an HTML file as the parameter of an applet, and transmits the
15 HTML file to the cellular phone. The cellular phone runs the applet embedded in the received HTML file, and transfers the print control codes to a printer. The printer prints the requested information based on the transferred print control codes.

20 Japanese Laid-open Patent Application No. 2001-350603, for example, proposes a printing system with which a user, while out of his/her office, can easily print unformatted data using a format designated by the user. A printing terminal provided
25 in the printing system downloads print data from a

Web server via the Internet. The user selects a format in which the print data are printed, and sets up print processing.

Japanese Laid-open Patent Application No.

5 2001-256012, for example, proposes a print system in which a user can print application-dependent documents located in the network at a designated timing using a network printer by operating a web browser. The print system includes a client computer,
10 a network printer, a file server computer, and a server computer connected to one another via a network. The server computer further includes a client service interface and a document print service. The client service interface transmits a print
15 request form to the client computer so that the web browser of the client computer informs the server computer of the address of document data and designates a condition specifying timing to print the document data. The client service interface also
20 interprets a print request received from the client computer and issues a print instruction at the designated timing. In response to the print instruction, the document print service retrieves the document data from the file server computer via the
25 Internet and/or the intranets, generates print data,

and transmits the generated print data to the network printer via the Internet and/or the intranets.

Japanese Laid-open Patent Application No. 2001-265552, for example, proposes a digital
5 information wide area print system. According to the invention, a user can print an HTML file or a VRML file stored in a WWW server using an Internet information receiving terminal disposed in convenience stores.

10 Japanese Laid-open Patent Application No. 2000-284919, for example, proposes a printer that can access the Internet alone and periodically print renewed web pages.

Additionally, according to the related art,
15 it is possible to transfer documents stored in a user terminal such as a mobile phone and a PC or documents stored in a network server to a remote image forming apparatus such as a printer and a multi functional peripheral via a network, and to print the
20 transferred documents. However, since the documents are transferred to the remote image forming apparatus via the network, the security of the documents matters.

Japanese Laid-open Patent Application No.
25 2002-32205, for example, proposes a network print

system in which a user can print image data using a printer disposed in a print store without carrying the image data with him/her. According to the invention, the user transmits the image data from his/her PC to a print service server. The print service server assigns a document ID to the transmitted image data and stores the transmitted image data and the assigned document ID. The user is informed of the assigned document ID. When visiting the print store, the user inputs the document ID to the printer. The printer transmits the input document ID to the print service server via the network. The print service server, in response to reception of the document ID, transmits the stored image data to the printer. The printer prints the image data.

Japanese Laid-open Patent Application No. 10-235974, for example, proposes a network print system. According to the invention, image data is transmitted to a network server. The network server assigns a job number and a password to the image data and stores the transmitted image data and the assigned job number and password related each other. The network server transmits the assigned job number and password. When a user input the job number and password, a printer acquires the image data

corresponding to the input job number and password from the net work server, and prints the acquired image data.

According to the related art described above, the security of files transmitted via a server is not considered at all. An employee of a company, for example, may directly transmit the file to a remote printer or a remote PC, if they are disposed in a branch office of the company, via the Internet. If the remote printer or the remote PC is disposed in a public place such as a convenience store, the file may be stolen by someone else. There is no guarantee that only a right receiver receives the file.

A mobile terminal such as a mobile phone and a personal data assistant (PDA) is not usually provided with a large memory capacity enough to receive a file. Even if a public printer is available, a user having nothing but the mobile terminal cannot print the file using the public printer.

20 SUMMARY OF THE INVENTION

Accordingly, it is a general object of the present invention to provide a novel and useful file transfer system, a file management server, a file transfer method, and a program for causing a computer to perform the file transfer method, an image forming

system, a stored document management server, and an image forming apparatus.

Another and more specific object of the present invention is to provide a file transfer
5 system, a file management server, a file transfer method, and a program for causing a computer to perform the file transfer method in which a receiving user, even if he/she does not carry an information terminal having a memory capacity large enough to
10 receive a file, can safely acquire the file from a transmitting user via the network.

Yet another and more specific object of the present invention is to provide an image forming system, a stored document management server, and an
15 image forming apparatus used for the image forming system in which a user can print a stored document stored in a remote apparatus without directly operating the remote apparatus.

To achieve one or more of the above objects,
20 a file transfer system according to an aspect of the present invention, includes: a file management server; a file transmitting terminal; and a file receiving terminal; wherein said file management server, said file transmitting terminal, and said
25 file receiving terminal are connected each other via

a network; said file transmitting terminal transmits
to said file management server a file and a
corresponding authorization condition for accessing
said file; said file management server stores said
5 file and said corresponding authorization condition
transmitted from said file transmitting terminal;
said file receiving terminal transmits to said file
management server a request for transferring said
file; and said file management server, in response to
10 said request transmitted by said file receiving
terminal, if said corresponding authorization
condition stored therein is satisfied, transfers the
file to said file receiving terminal.

The file transmitting terminal transmits
15 the file and the authorization condition for
accessing the file to the file management server. The
file management server stores the file and the
authorization condition for accessing the file
transmitted by the file transmitting terminal related
20 to the file. The file receiving terminal transmits a
request for transmitting the stored file to the file
management server. The file management server, in
response to reception of the request for transmitting
the stored file from the file receiving terminal,
25 determines whether the request satisfies the stored

authorization condition for accessing the file, and
if the authorization condition is satisfied,
transmits the file to the file receiving terminal.

According to another aspect of the present
5 invention, a file management server connected to a
file transmitting terminal and a file receiving
terminal via a network, includes: a communication
unit that exchanges data with an external apparatus
via said network; a first storage unit that stores a
10 file and an authorization condition for accessing
said file related each other; and a file transferring
unit that, in response to a request for transferring
said file stored in said first storage unit from said
file receiving terminal, if said authorization
15 condition is satisfied, transfers said file to said
file receiving terminal.

The communication unit exchanges data with
an external apparatus via the network. The first
storage unit stores the file and the authorization
20 condition for accessing the file received from the
file transmitting terminal, the authorization
condition being related to the file. The file
transferring unit, in response to reception of the
request for transferring the file from the file
25 receiving terminal, determines whether the request

satisfies the authorization condition stored in the first storage unit, and if the request satisfies the authorization condition is satisfied, transmits the file to the file receiving terminal.

5 According to yet another aspect of the present invention, an image forming system, includes: a first image forming apparatus; a user terminal; and a second image forming apparatus; wherein said first image forming apparatus, said user terminal, and said
10 second image forming apparatus are connected each other via a network; said first image forming apparatus stores a stored document and an authorization condition for accessing said stored document relating each other and, in response to a
15 request from said user terminal, if said authorization condition is satisfied, transmits said stored document and said authorization condition to said second image forming apparatus; and said second image forming apparatus stores said stored document
20 and said authorization condition relating each other and, if said authorization condition is satisfied, prints said stored document.

 A user can acquire the stored document stored in the first image forming apparatus by giving
25 an instruction for transmitting the stored document

from the user terminal. The first image forming apparatus, in response to reception of the instruction, transmits the stored document and the authorization condition for accessing the stored document to the second image forming apparatus. The second image forming apparatus, in response to input of the authorization condition, prints the stored document corresponding to the authorization condition. Accordingly, the user can print the stored document stored in the first image forming apparatus that is disposed in a remote place using the second image forming apparatus. The stored document is protected by the authorization condition from an access by unauthorized person.

According to yet another aspect of the present invention, an image forming system includes: a first image forming apparatus; a stored document management server; a user terminal; and a second image forming apparatus; wherein said first image forming apparatus, said stored document management server, said user terminal, and said second image forming apparatus are connected each other via a network; said first image forming apparatus stores a stored document and an authorization condition for accessing said stored document relating each other

and, in response to a request from said user terminal,
if said authorization condition is satisfied,
transmits said stored document and said authorization
condition to said stored document management server;
5 said stored document management server stores said
stored document and said authorization condition
transmitted from said first image forming apparatus
relating each other and, in response to a request for
transmitting said stored document from said second
10 image forming apparatus, if said authorization
condition for accessing said stored document is
satisfied, transmits said stored document to said
second image forming apparatus; and said second image
forming apparatus prints said stored document
15 transmitted from said stored document management
server.

A user can acquire the stored document
stored in the first image forming apparatus by giving
an instruction for transmitting the stored document
20 from the user terminal. The first image forming
apparatus, in response to reception of the
instruction, transmits the stored document and the
authorization condition for accessing the stored
document to the stored document management server.
25 The stored document management server, in response to

reception of the stored document and the authorization condition, transmits the authorization information for accessing the stored document to the user terminal. The second image forming apparatus, in response to input of the authorization condition, transmits the authorization condition to the stored document management server. The stored document management server, in response to reception of the authorization condition received from the second image forming apparatus, transmits the stored document to the second image forming apparatus. The second image forming apparatus prints the stored document received from the stored document management server transmits. Accordingly, the user can print the stored document stored in the first image forming apparatus that is disposed in a remote place using the stored document management server and the second image forming apparatus. The stored document remains protected by the authorization condition from an access by unauthorized person.

Other objects, features, and advantages of the present invention will become more apparent from the following detailed description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a system diagram of a file transfer system according to a first embodiment;

FIG. 2 is a block diagram showing the structure of a file management server according to
5 the first embodiment;

FIG. 3 is an example of a user management table stored in a personal information memory according to the first embodiment;

FIG. 4 is an example of data format stored
10 in a file data memory according to the first embodiment;

FIG. 5 is a flow diagram for explaining file transfer of the file transfer system according to the first embodiment;

15 FIG. 6 is a flow diagram for explaining file transfer of the file transfer system according to the first embodiment;

FIG. 7 is a flow diagram for explaining file transfer of the file transfer system according
20 to the first embodiment;

FIG. 8 shows the transition of web pages provided by the file management server according to the first embodiment;

FIG. 9 is an example of group management
25 table stored in the personal information memory

according to a second embodiment;

FIG. 10 is an example of data format stored in the file data memory according to the second embodiment;

5 FIG. 11 is a flow diagram for explaining file transfer of a file transfer system according to the second embodiment;

FIG. 12 is a flow diagram for explaining file transfer of a file transfer system according to
10 the second embodiment;

FIG. 13 shows the transition of web pages provided by the file management server according to the second embodiment;

FIG. 14 is a flow diagram for explaining
15 file transfer of a file transfer system according to a third embodiment;

FIG. 15 is a flow diagram for explaining file transfer of a file transfer system according to the third embodiment;

20 FIG. 16 shows the transition of web pages provided by the file management server according to the third embodiment;

FIG. 17 is a system diagram showing an image forming system according to a fourth
25 embodiment;

FIG. 18 is a front view showing a multi functional peripheral A1 according to the fourth embodiment;

FIG. 19 is an enlarged cross section showing a printer 2100 according to the fourth embodiment;

FIG. 20 is a block diagram showing the structure of the multi functional peripheral A1 according to the fourth embodiment;

FIG. 21 is a block diagram showing the structure of an operations board 330 according to the fourth embodiment;

FIG. 22 is a schematic diagram showing the operations board 330 according to the fourth embodiment;

FIG. 23 is a flow diagram showing Internet transfer control of a system controller 31 of an image data processing apparatus ACP according to the fourth embodiment;

FIG. 24 is a flow showing print control of a system controller 31 according to the fourth embodiment;

FIG. 25 is a block diagram showing an image forming system according a fifth embodiment;

FIG. 26 is a flow diagram showing Internet

transfer control of the system controller 31 of the image data processing apparatus ACP of the multi functional peripheral A1 according to the fifth embodiment;

5 FIG. 27 is a flow diagram showing transfer operation of a server D according to the fifth embodiment;

 FIG. 28 is a flow diagram showing the print control of the system controller 31 of the image data
10 processing apparatus ACP of the multi functional peripheral A1 according to the fifth embodiment; and

 FIG. 29 is a flow diagram showing transfer operation of the server D according to a variation of the fifth embodiment.

15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

 Preferred embodiments of the present invention are described below with reference to the drawings.

 [FIRST EMBODIMENT]

20 A file transfer system according to the first embodiment is described in detail below.

 (Structure of the file transfer system)

 FIG. 1 is a system diagram showing the structure of a file transfer system according to the
25 first embodiment. In FIG. 1, "1" denotes the Internet,

"2" and "3" denote a Local Area Networks (LAN) connected to the Internet. A file management server 10 of a service provider is connected to the Internet 1. File transmitting terminals 20 such as a Personal Computer (PC) 20a, a notebook PC 20b, and a Multi Functional Peripheral (MFP) 20C are connected to the LAN 2. File receiving terminals such as a printer 30a-1, an MFP 30a-2, and a PC 30b are connected to the LAN 3. The LAN 3 is usually built in a shop such as a convenience store and a gas station. The file receiving terminals 30 are set up in the shop. "40" denotes a mobile terminals such as a Personal Data Assistant (PDA) 40a, a notebook PC 40b, and a cellular phone 40c of a user. The MFPs 20c, 30a-2 are described in detail below.

The file management server 10 can operate as a Web server. The file transmitting terminal 20, the file receiving terminal 30, and the mobile terminal 40 are provided with a Web browser (a computer program). The user of the file transfer system can browse Web pages stored in the file management server 10.

The file management server 10 retains Web pages used for file transfer services. The file transmitting terminals 20 such as the PC 20a, the

notebook PC 20b; and the MFP 20c uploads files by
accessing the Web pages for file transfer service.
The file receiving terminals 30 including image
forming apparatuses 30a such as the printer 30a-1 and
5 the MFP 30a-2, and the PC 30b downloads the files
uploaded by the file transmitting terminals 20 by
accessing the Web pages for file transfer service.
The file transmitting terminal 20, the file receiving
terminal 30, and the mobile terminal 40 are provided
10 with network interface such as wire-less LAN and
Bluetooth. The file receiving terminal 30 and the
mobile terminal 40 communicates each other via the
wireless LAN and/or the Bluetooth. The file receiving
terminal 30 and the mobile terminal 40 access the
15 file management server 10 via a LAN, or directly
access the service provider through a telephone
channel.

The file transfer operation of the above
file transfer system is described below. The file
20 transmitting terminal 20 uploads a file and an
authorization condition (a password, for example) for
accessing the file to the file management server 10.
The file management server 10 relates and stores the
file and the authorization condition for accessing
25 the file. A transmitting user of the file

transmitting terminal 20 informs the mobile terminal
40 of the receiving user about the name of the file
and the authorization condition (password, for
example) for accessing the file in advance using the
5 file transmitting terminal 20, for example.

The receiving user, using the file
receiving terminal 30, transmits a request for
transmitting the file that designates the name of the
file. If the request for transmitting the file
10 satisfies an authorization condition of the file (a
password set to the file, for example), the file
management server 10, in response to the request for
transmitting the file, permits access to the file
thereby to transmit the file. In the case that the
15 file receiving terminal 30 is an image forming
apparatus, that is, the printer 30a-1 or the MFP 30a-
2, the printer 30a-1 and/or the MFP 30a-2 print the
received file. In the case that the file receiving
terminal 30 is the PC 30b, the PC 30b stores the
20 received file to a hard disk provided therein. In the
case of the MFP 30a-2, the MFP 30a-2 may store the
received file in a hard disk, and output (output
formed image) afterwards.

[STRUCTURE OF FILE MANAGEMENT SERVER]

25 FIG. 2 is a block diagram showing the

structure of the file management server 10 shown in FIG. 1. The file management server 10 is provided with the following: a communication interface 101, a CPU 102, a RAM 103, a display unit 104, a operations unit 105, a personal information memory 106, a file data memory 107, a hard disk drive 108, and a disk drive 109. Each unit is connected to each other via a bus.

The communication interface 101 is an interface for exchanging data with an external apparatus via the Internet 1. The CPU 102 controls each unit in accordance with programs stored in the hard disk (HDD) 108 or a flexible disk (FD) and/or a CD-ROM set at the disk drive 109. The communication interface 101, the RAM 103, the display unit 104, the operations unit 105, the personal information memory 106, the file data memory 107, the hard disk drive 108, and the disk drive 109 are connected to the CPU 101. The CPU 101 controls reading and writing of data, displaying, inputting from keyboard, and data communication. The display unit 104 includes a display apparatus such as an LCD and a CRT. The operations unit 105 is a user interface for a user to input data or instructions. The operations unit 105 may be a keyboard provided with a cursor key, numeric

keys, and various functional keys, a mouse, and a scanner that reads images.

Various computer programs (OS, Web server program, for example) that are executed by the CPU 101 and data (Web pages, for example) are stored in the HDD 108. The CPU 101 executes the Web server program, and makes the Web pages stored in the HDD 108 public in the network. The CPU 101 further executes file transfer service that is to be described below. The Web pages are described in Hyper Text Markup Language (HTML) that Web application software can browse.

A user management table in which user IDs and passwords are registered for controlling users is stored in the personal information memory 106. FIG. 3 shows an example of the user management table. As shown in FIG. 3, the passwords are related to the respective user ID, and registered in the user management table.

The file data memory 107 stores file names, the passwords for accessing the files (file passwords), the expiry dates of the files, the maximum number of transfers of the files, and file data related to each other. FIG. 4 shows an example of the data format stored in the file data memory 107.

The CPU 101 controls the data stored in the file data memory 107. The CPU 101 registers, searches, and/or deletes data, if necessary. When transmitting the file, the CPU 101 decrements the effective number T
5 of transfers of the file by 1. If the effective number T of transfers of the file becomes "0", or the effective period of the file has expired, the CPU 101 deletes the file (file name, password, expiry date, effective number T of transfers, and file data).

10 The disk drive 109 reads and writes data to a flexible disk (FD) and/or a CD-ROM.

[FILE TRANSFER PROCESSING]

FIGs. 5-7 are flow charts for explaining file transfer processing of the file transfer system shown in FIG. 1. FIG. 8 shows an example of screens
15 of Web pages provided by the file management server 10. In the following description, the case in which an image forming apparatus such as the printer 30a-1 or the MFP 30a-2 are used as the file receiving
20 terminal 30.

File transfer processing of the file transfer system shown in FIG. 1 is described in accordance with the flow charts of FIGs. 5-7 and the screens of FIG. 8. First, processing for registering
25 a file from the file transmitting terminal 20 of a

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transmitting user to the file management server 10.
In FIG. 5, when a file needs to be transmitted to a
remote receiving user, the transmitting user using
the file transmitting apparatus 20 inputs URL of a
5 Web page of the file management server 10 thereby to
access the file management server 10 (step S1). The
file management server 10, in response to the access
from the file transmitting terminal 20, transmits a
Web page W1 (first page) shown in FIG. 8 thereby to
10 request the transmitting user to input his/her user
ID and password (step S11). Input boxes for a user ID
and a password and an enter button, for example, are
provided in the Web page W1.

The file transmitting terminal 20, in
15 response to receipt of the Web page W1, shows the
received Web page W1 on the display unit. When the
transmitting user inputs his/her user ID and password
and presses the enter button, the input user ID and
password are transmitted to the file management
20 server 10 (step S2).

The file management server 10, in response
to reception of the transmitted user ID and password
from the file transmitting terminal 20, determines
whether the received user ID and password are
25 registered in the personal information table stored

in the personal information memory 106 (step S12). If a negative determination is made ("No" in step S12), the process returns to step S11, and transmits the Web page W1 gain. If a positive determination is made
5 ("Yes" in step S12), a Web page W2 for selecting a service is transmitted to the file transmitting terminal 20 (step S13). The Web page W2 includes two selection items, that is, "1. writing file" and "2. transferring file" and an enter button. The
10 transmitting user who received the Web page W2 can select one of selection items.

The file transmitting terminal 20, in response to reception of the Web page W2, displays the Web page W2 on the display unit. When "1. writing
15 file" is selected and the enter button is pressed, the file transmitting terminal 20 transmits a request for writing a file to the file management server 10 (step S3).

The file management server 10, in response
20 to reception of the request for writing a file from the file transmitting terminal 20, transmits a web page W3 shown in FIG. 8 for setting a file name and an access right to the file to the file transmitting terminal 20 (step S14). The web page W3 includes
25 input boxes for "file name" of a file, "password"

corresponding to the file (file password), "expiry date" of the file, and "effective number of transfers" for which the file is transferable, and an enter button.

5 The file transmitting terminal 20, in response to reception of the web page W3, displays the web page W3 on the display unit. When the transmitting user inputs the "file name", "password", "expiry date", and "effective number of transfers"
10 into the respective input boxes, and presses the enter button, the file transmitting terminal 20 transmits the "file name", "password", "expiry date", "effective number of transfers", and the file data to the file management server 10 (step S4).

15 The file management server 10 relates the "file name", "file password", "expiry date", "effective number of transfers" to each other, and stores them in the file data memory 107 (step S15). Then, uploading of a file is completed.

20 Deleting of data stored in the file data memory 107 of the file management server 10 is described below. FIG. 6 is a flow chart for explaining deleting of data stored in the file data memory 107 of the file management server 10. The file
25 management server 10 periodically checks data stored

in the file data memory 107. If the effective period of the file has been expired (step S21) or the effective number of transfers $T=0$ (step S22), the file management server 10 deletes the file (step S23).

5 A process in which a receiving user accessed the file management server 10 and downloads a file is described below. In FIG. 7, the receiving user, using his/her mobile terminal 40, sets the following in the image forming apparatus 30a: the URL
10 of the web page of the file management server 10, a user ID, a password, the file name of a file that the receiving user desires to print, and a password for accessing the file (file password) (step S41). The file receiving terminal 30 that downloads the file
15 may be the PC 30b instead of the image forming apparatus 30a (the printer 30a-1 and the MFP 30a-2, for example).

When the URL of the web page of the file management server 10 is set, the image forming
20 apparatus 30a accesses the file management server 10 (step S51). The file management server 10, in response to an access from the image forming apparatus 30a, the file management server 10 transmits the web page W1 (first page) shown in FIG.
25 8 for inputting a user ID and a password (step S31).

The image forming apparatus 30a, in response to reception of this web page W1, displays the web page W1 on the display unit. When the receiving user inputs his/her user ID and password in the web page W1 and presses the enter button, the user ID and the password are transmitted to the file management server 10 (step S52).

The file management server 10, in response to reception of the user ID and the password from the image forming apparatus 30a, determines whether the user ID and the password are registered in the personal information table stored in the personal information memory 106 (step S32). If a negative determination is made (No in step S32), the process returns to step S31, and transmits the web page W1 again. If a positive determination is made (Yes in step S32), the web page W2 shown in FIG. 8 for selecting a service item is transmitted to the image forming apparatus 30a (step S53).

The image forming apparatus 30a, in response to reception of the web page W2, displays the web page W2. When the receiving user selects "2. transferring file" in the web page W2 and presses the enter button, a request for transmitting a file is transmitted to the file management server 10 (step

S53).

The file management server 10, in response to reception of the request for transmitting a file from the image forming apparatus 30a, transmits a web page W4 for designating a file shown in FIG. 8 to the image forming apparatus 30a (step S34). The web page W4 includes input boxes "file name" and "password" for accessing the file (file password), and an enter button.

The image forming apparatus 30a, in response to reception of the web page W4, displays the web page W4. When the receiving user inputs the "file name" and "password", and presses the enter button, the "file name" and the "password" are transmitted to the file management server 10 (step S54).

The file management server 10, in response to reception of the "file name" and the "password", determines whether there is a file corresponding to the received file name in the file data memory 107 (step S35). This step is needed because, as described above, if the effective period of the file has been expired or the effective number of transfers $T=0$, the file may have been deleted. If a negative determination is made (No in step S35), the process

proceeds to step S38, and transmits a web page (not shown) for informing the receiving user that the file is not transferable to the image forming apparatus 30a (step S38).

5 The image forming apparatus 30a, in response to reception of the web page for informing the receiving user that the file is not transferable, displays the web page on the display unit (step S56). If a positive determination is made (Yes in step S35),
10 the image forming apparatus 30a determines whether the received password for accessing the file (file password) is correct with reference to the file data memory 107 (step S36). If a negative determination is made, that is, the password is not correct (No in
15 step S36), the process returns to step S34, and transmits the web page W4 to the image forming apparatus 30a again. If the password is correct (yes in step S36), the file management server transmits the file to the image forming apparatus 30a (step
20 S37). Then, the file management server 10 decrements the effective number of transfers of the file by "1" (step S39). The image forming apparatus 30a, in response to reception of the file, outputs (prints) the file (step S55). The image forming apparatus 30a
25 may temporarily store the received file in a hard

disk provided therein and, after receiving a further instruction from the receiving user, output the file.

The case in which the file receiving terminal 30 is an image forming apparatus 30a such as the printer 30a-1 and the Multi Functional Peripheral (MFP) 30a-2 is described above. The case in which the receiving terminal 30 is the PC 30b is almost identical except that the received file is stored in a flexible disk FD, for example. Accordingly, the description of the latter case is omitted.

According to a first embodiment described above, a user of the file transmitting terminal 20 uploads a file and a password for accessing the file to the file management server 10. The file management server 10 stores the file and the password relating to each other. The file management server 10, in response to reception of a request for transmitting the file from the file receiving terminal 30, checks the password, and if the password is correct, transmits the designated file. A receiving user, even if he/she does not have a mobile apparatus having memory capacity large enough to receive the file, can receive the file using the file receiving terminal such as a printer, an MFP, and a PC disposed in a nearby shop, for example. If the file provider

attaches a password to the file, the file management server does not transmit the file to anybody who does not know the password. Accordingly, the security of the file is improved.

5 Additionally, according to the first embodiment, the transmitting user of the file transmitting terminal 20 can designate an effective period of a file in which the file remains accessible, and the file management server 10 prohibits anyone
10 from accessing the file once the effective period expires. Accordingly, the file transfer system can improve the security of the transmitted file.

 Additionally, according to the first embodiment, the transmitting user of the file
15 transmitting terminal 20 can designate the effective number of transfers of the file. Even if a plurality of users are authorized to access the file, the security of the file can be improved.

 Additionally, according to the first
20 embodiment, the file management server 10 decrements by 1 the effective number of transfers each time the file management server 10 transmits the file. When the effective number of transfers $T=0$ or the effective period of the file expires, the file
25 management server 10 deletes data (the file name, the

password, the expiry date, the effective number T of transfers) as well as the file, memory resources can be used efficiently.

The file management server 10 may
5 automatically delete the file after transmitting the file once. In this case, the file transmitting terminal 10 does not need to designate the expiry date and the effective number of transfers. Accordingly, the security of the file can be improved
10 and the memory resource can be used efficiently.

[SECOND EMBODIMENT]

A file transfer system according to a second embodiment is described with reference to the above FIGs. 1, 2, and FIGs. 9-13. When uploading a
15 file to the file management server 10, the file transmitting terminal 20 designates a group name as a condition for accessing the file. Only users whose user ID belongs to the group can access the file.

The structure of the file transfer system
20 according to the second embodiment is identical to that of the first embodiment (see FIG. 1). The structure of the file management server 10 is almost identical to that of the file management server according to the first embodiment (see FIG. 2), but
25 is different in that the file management server 10

according to the second embodiment stores a group registration table in which group names and corresponding user IDs in the personal information memory 106.

5 FIG. 9 shows an example of the group registration table. As shown in FIG. 9, two groups A and B are registered in the group registration table. Members whose user IDs are u_1, u_2, and u_3 belong to the group A, and members whose user IDs are u_2
10 and u_4 belong to the group B. The group includes a company or a school, for example. When uploading a file to the file management server 10, the file transmitting terminal 20 designates a group that can access the file. Only a receiving user of the file
15 receiving terminal 30 who inputs a user ID who belongs to the designated group can access the file. In the case that the group B is designated, only the users u_2 and u_4 can access the file.

 FIG. 10 shows an example of the format of
20 data stored in the file data memory 107. The data format shown in FIG. 10 is different from the data format according to the first embodiment in that the group name is registered instead of the password. As shown in FIG. 10, the file name, the group name that
25 is authorized to access the file, the expiry date of

the file, and the effective number T of transfers of the file, and the file data relating to each other, input by the file transmitting terminal 20 of the transmitting user are stored in the file data memory
5 107.

FIGs. 11 and 12 are flow charts for explaining the file transfer system according to the second embodiment. FIG. 13 shows the transition of web pages provided by the file management server 10.
10 In the following description, the file receiving terminal 30 is assumed to be an image forming apparatus 30a such as the printer 30a-1 and the MFP 30a-2.

File transfer processing of the file
15 transfer system shown in FIG. 1 is described in accordance with the flow charts of FIGs. 11 and 12, and the exemplary web pages shown in FIG. 13. First, processing for registering a file from the file transmitting terminal 20 of a transmitting user to
20 the file management server 10. In FIG. 11, when a file needs to be transmitted to a remote receiving user, a transmitting user using the file transmitting apparatus 20 inputs URL of a Web page of the file management server 10 thereby to access the file
25 management server 10 (step S61). The file management

server 10, in response to the access from the file transmitting terminal 20, transmits a Web page W1 (first page) shown in FIG. 13 thereby to request the transmitting user to input his/her user ID and
5 password (step S71). Input boxes for a user ID and a password and an enter button, for example, are provided in the Web page W1.

The file transmitting terminal 20, in response to receipt of the Web page W11, shows the
10 received Web page W1 on the display unit. When the transmitting user inputs his/her user ID and password and presses the enter button, the input user ID and password are transmitted to the file management server 10 (step S62).

15 The file management server 10, in response to reception of the transmitted user ID and password from the file transmitting terminal 20, determines whether the received user ID and password are registered in the personal information table stored
20 in the personal information memory 106 (step S72). If a negative determination is made ("No" in step S72), the process returns to step S71, and transmits the Web page W11 again. If a positive determination is made ("Yes" in step S72), a Web page W12 for
25 selecting a service is transmitted to the file

transmitting terminal 20 (step S73). The Web page W12 includes two selection items, that is, "1. writing file" and "2. transferring file", and an enter button. The transmitting user who received the Web page W12
5 can select one of the selection items.

The file transmitting terminal 20, in response to reception of the Web page W12, displays the Web page W12 on the display unit. When "1. writing file" is selected and the enter button is
10 pressed, the file transmitting terminal 20 transmits a request for writing a file to the file management server 10 (step S63).

The file management server 10, in response to reception of the request for writing a file from
15 the file transmitting terminal 20, transmits a web page W13 shown in FIG. 13 for setting a file name and an access right to the file, to the file transmitting terminal 20 (step S74). The web page W13 includes input boxes for "file name" of a file, "group name"
20 that is authorized to access the file, "expiry date" of the file, and "effective number of transfers" for which the file is transferable, and an enter button.

The file transmitting terminal 20, in response to reception of the web page W13, displays
25 the web page W13 on the display unit. When the

transmitting user inputs the "file name", "group name", "expiry date", and "effective number of transfers" into the respective input boxes, and presses the enter button, the file transmitting terminal 20 transmits the "file name", "group name", "expiry date", "effective number of transfers", and the file data to the file management server 10 (step S64).

The file management server 10 relates the "file name", "group name", "expiry date", "effective number of transfers" to each other, and stores them in the file data memory 107 (step S75). Then, uploading of a file is completed.

The file management server 10 checks files stored in the file data memory 107 and deletes the files of which effective period has expired or the effective number of transfers $T=0$ in the same manner as the first embodiment (see FIG. 6).

Processing in which a receiving user accessed the file management server 10 and downloads a file is described below. In FIG. 12, the receiving user, using his/her mobile terminal 40, sets the following in the image forming apparatus 30a: the URL of the web page of the file management server 10, a user ID, a password, the file name of a file that the

receiving user desires to print, and a password for
accessing the file (file password) (step S91). The
file receiving terminal 30 that downloads the file
may be the PC 30b instead of the image forming
5 apparatus 30a (the printer 30a-1 and the MFP 30a-2,
for example).

When the URL of the web page of the file
management server 10 is set, the image forming
apparatus 30a accesses the file management server 10
10 (step S101). The file management server 10, in
response to an access from the image forming
apparatus 30a, transmits the web page W11 (first
page) shown in FIG. 13 for inputting a user ID and a
password (step S81).

15 The image forming apparatus 30a, in
response to reception of this web page W11, displays
the web page W11 on the display unit. When the
receiving user inputs his/her user ID and password in
the web page W11 and presses the enter button, the
20 user ID and the password are transmitted to the file
management server 10 (step S102).

The file management server 10, in response
to reception of the user ID and the password from the
image forming apparatus 30a, determines whether the
25 user ID and the password are registered in the

personal information table stored in the personal information memory 106 (step S82). If a negative determination is made (No in step S82), the process returns to step S81, and transmits the web page W1 again. If a positive determination is made (Yes in step S82), the web page W12 for selecting a service item, shown in FIG. 13, is transmitted to the image forming apparatus 30a (step S83).

The image forming apparatus 30a, in response to reception of the web page W12, displays the web page W12 on the display unit. When the receiving user selects "2. transferring file" in the web page W12 and presses the enter button, a request for transmitting a file is transmitted to the file management server 10 (step S103).

The file management server 10, in response to reception of the request for transmitting a file from the image forming apparatus 30a, transmits a web page W14 for designating a file shown in FIG. 13 to the image forming apparatus 30a (step S84). The web page W14 includes input boxes "file name" and an enter button.

The image forming apparatus 30a, in response to reception of the web page W14, displays the web page W14. When the receiving user inputs the

"file name" that he/she desires to print, and presses the enter button, the "file name" is transmitted to the file management server 10 (step S104).

The file management server 10, in response to reception of the "file name", determines whether there is a file corresponding to the received file name in the file data memory 107 (step S85). This step is needed because, as described above, if the effective period of the file has been expired or the effective number of transfers $T=0$, the file may have been deleted.

If a negative determination is made (No in step S85), the process proceeds to step S88, and transmits a web page (not shown) for informing the receiving user that the file is not transferable to the image forming apparatus 30a (step S88). If there is the designated file (Yes in step S85), the file management server 10 verifies the group name designated to the designated file by referring to the file data memory 107 (see FIG. 9). The file management server 10 further determines whether the received user ID belongs to the group by referring to the group registration table (see FIG. 10) (step S86). If the received user ID does not belong to the designated group (No in step S86), the process

proceeds to step S88. In step S88, the file management server 10 transmits a web page (not shown) for informing the receiving user that the file is not transferable to the image forming apparatus 30a. The
5 image forming apparatus 30a, in response to reception of the web page for informing the receiving user that the file is not transferable, displays the web page on the display unit (step S106).

If a positive determination is made, that
10 is, the received user ID belongs to the designated group (Yes in step S86), the file management server 10 transmits the designated file to the image forming apparatus 30a (step S87). Then, the file management server 10 decrements the effective number of
15 transfers of the file, stored in the file data memory 107, by "1" (step S89). The image forming apparatus 30a, in response to reception of the file, outputs (prints) the file (step S105). The image forming apparatus 30a may temporarily store the received file
20 in a hard disk provided therein and, after receiving a further instruction from the receiving user, output the file.

The case in which the file receiving terminal 30 is an image forming apparatus 30a such as
25 the printer 30a-1 and the Multi Functional Peripheral

(MFP) 30a-2 is described above. The case in which the receiving terminal 30 is the PC 30b is almost identical except that the received file is stored in a flexible disk FD, for example. Accordingly, the
5 description of the latter case is omitted.

According to the second embodiment described above, the file management server 10 stores relating the group name and the user IDs of group members. When uploading a file, the file transmitting
10 terminal 20 transmits the file and a group name that is authorized to access the file, to the file management server 10. The file management server 10 stores relating the uploaded file with the group name. The file management server 10, in response to
15 reception of a request for transmitting the file from the file receiving terminal 30, determines whether the user ID received from the file receiving terminal 30 belongs to the group designated to the file. Only if the received user ID belongs to the designated
20 group, the file management server 10 transmits the file to the file receiving terminal 30. Accordingly, in the file transfer system according to the second embodiment, only group members can access the file stored in the file management server 10, and anyone
25 who does not belong to the group is prohibited from

accessing the file stored in the file management
server 10. Whereas a receiving user using the file
transfer system according to the first embodiment is
required to input a password, a receiving user who is
5 a group member, using the file transfer system
according to the second embodiment can access the
file without inputting passwords.

According to the second embodiment
described above, when a file is uploaded to the file
10 management server 10, a group that is authorized to
access the file is designated. Instead of designating
a group, one or more users who are authorized to
access the file may be designated. In this case, only
the designated users can download the file from the
15 file management server 10, and any user who is not
designated cannot access the file.

[THIRD EMBODIMENT]

A file transfer system according to a third
embodiment is described with reference to the above
20 FIGs. 1, 2, and FIGs. 14-16. According to the third
embodiment, a user of a mobile terminal 40 obtains
the IP address of the file receiving terminal 30 and
informs the file management server 10 of the obtained
IP address. The file management server 10 registers
25 the informed IP address, and accepts a request for

transmitting a file from only file receiving terminal 30 of which IP address is registered.

The structure of the file transfer system according to the third embodiment is identical to that of the first embodiment (see FIG. 1). The structure of the file management server 10 is almost identical to that of the file management server according to the first embodiment (see FIG. 2), but is different in that the file management server 10 according to the third embodiment stores file names and IP addresses of file receiving terminals that are permitted to access the file, in the personal information memory 106.

File transfer processing of the file transfer system according to the third embodiment is described in accordance with the flow charts of FIGS. 14 and 15, and the exemplary web pages shown in FIG. 16. Processing for uploading a file from the file transmitting terminal 20 to the file management server 10 is the same as that of the first embodiment described with reference to FIG. 5. The file management server 10 periodically checks files stored in the file data memory 107, and deletes files of which effective period have expired or effective number of transfers $T=0$ in the same manner as the

file management server 10 according to the first embodiment.

Processing for registering the IP address of a file receiving terminal 30 that is authorized to access the file is described below. In FIG. 14, the receiving user, using the mobile terminal 40, requests the image forming apparatus 30a such as the printer 30a-1 and the Multi Functional Peripheral 30a-2, to transmit its IP address (step S121). The image forming apparatus 30a, in response to reception of the request for the IP address, transmits its IP address to the mobile terminal 40 (step S131).

A transmitting user using the file transmitting apparatus 20 inputs URL of a Web page of the file management server 10 thereby to access the file management server 10 (step S122). The file management server 10, in response to the access from the file transmitting terminal 20, transmits a Web page W21 (first page) shown in FIG. 16 thereby to request the transmitting user to input his/her user ID and password (step S111). Input boxes for a user ID and a password and an enter button, for example, are provided in the Web page W21.

The file transmitting terminal 20, in response to receipt of the Web page W21, shows the

received Web page W21 on the display unit. When the transmitting user inputs his/her user ID and password and presses the enter button, the input user ID and password are transmitted to the file management
5 server 10 (step S123).

The file management server 10, in response to reception of the transmitted user ID and password from the mobile terminal 40, determines whether the received user ID and password are registered in the
10 personal information table stored in the personal information memory 106 (step S112). If a negative determination is made ("No" in step S112), the process returns to step S111, and transmits the Web page W21 again. If a positive determination is made
15 ("Yes" in step S112), a Web page W22 for selecting a service is transmitted to the mobile terminal 40 (step S113). The Web page W22 includes two selection items, that is, "1. writing file", "2. transferring file", and "3. setting access permission", and an
20 enter button. The transmitting user who received the Web page W22 can select one of the selection items.

The mobile terminal 40, in response to reception of the Web page W22, displays the Web page W22. When "3. setting access permission" is selected
25 and the enter button is pressed, the a request for

setting an access permission is transmitted to the file management server 10 (step S124).

The file management server 10, in response to reception of the request for setting an access permission from the mobile terminal 40, transmits a web page W23 shown in FIG. 16 for inputting a file name and setting an access right to the file, to the mobile terminal 40 (step S114). The web page W23 includes input boxes for "file name" and the "IP address" from which an access is authorized, and an enter button.

The mobile terminal 40, in response to reception of the web page W23, displays the web page W23 on a display unit. When the transmitting user inputs the "file name" and "IP address" into the respective input boxes, and presses the enter button, the mobile terminal 40 transmits the "file name" and the "IP address" to the file management server 10 (step S125).

The file management server 10 relates the "file name" and the "IP address" to each other, and stores them in the personal information memory 106 (step S115). The registration of IP address then ends.

Processing in which a receiving user accessed the file management server 10 and downloads

a file is described below. In FIG. 15, the receiving user, using his/her mobile terminal 40, sets the following in the image forming apparatus 30a: the URL of the web page of the file management server 10, a
5 user ID, a password, the file name of a file that the receiving user desires to print, and a password for accessing the file (file password) (step S161).

When the URL of the web page of the file management server 10 is set, the image forming
10 apparatus 30a accesses the file management server 10 (step S171). The file management server 10, in response to an access from the image forming apparatus 30a, transmits the web page W21 (first page) shown in FIG. 16 for inputting a user ID and a
15 password (step S141).

The image forming apparatus 30a, in response to reception of this web page W21, displays the web page W21 on the display unit. When the receiving user inputs his/her user ID and password in
20 the web page W21 and presses the enter button, the user ID and the password are transmitted to the file management server 10 (step S172).

The file management server 10, in response to reception of the user ID and the password from the
25 image forming apparatus 30a, determines whether the

user ID and the password are registered in the personal information table stored in the personal information memory 106 (step S142). If a negative determination is made (No in step S142), the process
5 returns to step S141, and transmits the web page W21 again. If a positive determination is made (Yes in step S142), the web page W22 for selecting a service item, shown in FIG. 16, is transmitted to the image forming apparatus 30a (step S143).

10 The image forming apparatus 30a, in response to reception of the web page W22, displays the web page W22 on the display unit. When the receiving user selects "2. transferring file" in the web page W22 and presses the enter button, a request
15 for transmitting a file is transmitted to the file management server 10 (step S173).

 The file management server 10, in response to reception of the request for transmitting a file from the image forming apparatus 30a, transmits a web
20 page W24 for designating a file shown in FIG. 16 to the image forming apparatus 30a (step S144). The web page W24 includes input boxes "file name" and "password", and an enter button.

 The image forming apparatus 30a, in
25 response to reception of the web page W24, displays

the web page W24 on the display unit. When the receiving user inputs the "file name" that he/she desires to print and the "password" for accessing the file, and presses the enter button, the "file name" and the "password" are transmitted to the file management server 10 (step S174).

The file management server 10, in response to reception of the "file name" and the "password" from the image forming apparatus 30a, determines whether there is a file corresponding to the received file name in the file data memory 107 (step S145). This step is needed because, as described above, if the effective period of the file has been expired or the effective number of transfers $T=0$, the file may have been deleted. If a negative determination is made (No in step S145), the process proceeds to step S149, and transmits a web page (not shown) for informing the receiving user that the file is not transferable to the image forming apparatus 30a (step S149). The image forming apparatus 30a, in response to reception of the web page informing that the file is not transferable, displays the received web page on the display unit (step S176).

If there is the designated file (Yes in step S145), the file management server 10 verifies

the password for accessing the file by referring to the file data memory 107 (step S146). If the password is not correct (No in step S146), the process returns to step S144, and transmits the web page W24 to the
5 image forming apparatus 30a again. If the password is correct (yes in step S136), the file management server 10 determines whether the IP address of the image forming apparatus 30a matches the IP address registered in the personal information memory 106
10 (step S147). If the IP addresses do not match (no in step S147), the process proceeds to step s149. The file management server 10 transmits a web page for informing the receiving user that the file is not transferable (not shown) to the image forming
15 apparatus 30a (step s149).

If the IP address of the image forming apparatus 30a matches the IP address registered in the personal information memory 106 (yes in step s147), the file management server 10 reads the
20 designated file from the file data memory 106 and transmits the file to the image forming apparatus 30a (step S148). The process proceeds to step s150, and decrements the effective number of transfers T stored in the file data memory 107 by "1". The image forming
25 apparatus 30a, in response to reception of the file,

prints the file (step S175).

The case in which the file receiving terminal 30 is an image forming apparatus 30a such as the printer 30a-1 and the Multi Functional Peripheral (MFP) 30a-2 is described above. The case in which the receiving terminal 30 is the PC 30b is almost identical except that the received file is stored in a flexible disk FD, for example. Accordingly, the description of the latter case is omitted.

According to the third embodiment described above, the user of the mobile terminal 40 obtains the IP address of the file receiving terminal 30 and informs the IP address to the file management server 10. The file management server 10 accepts a request for transmitting the file only if the request is from the designated IP address. Accordingly, the file management server 10 can identify the file receiving terminal that is authorized to receive the file, and only authorized file receiving terminal can access the file.

In the file transfer system according to the third embodiment described above, a password for accessing the file is uploaded from the file transmitting terminal 20 to the file management server 10 in the same manner as the first embodiment.

However, a user group may that is authorized to access the file may be designated and transmitted to the file management server 10 in the same manner as the second embodiment.

5 [FOURTH EMBODIMENT]

FIG. 17 is an image forming system according to a fourth embodiment of the present invention. A Multi Functional Peripherals (MFP) A1 and A2, that is, image forming apparatuses, may be
10 multi functional color copiers having the same specifications, for example. The MFP A1 and A2 can communicates each other via a local area network (LAN) and/or the Internet B. The MFP A1 and A2 also can communicates with a personal computer PC, a
15 notebook PC, a personal data assistant (PDA), and a mobile phone, for example. The MFP A1 and A2 may not have the same specifications.

According to an embodiment, the MFP A1 stores documents (stored documents) such as image
20 data acquired by a scanner and a digital camera, image data created by computer graphics and CAD, document data created by a word processor, and facsimile data. When a user needs to access a stored document but is far from the MFP A1, the user
25 accesses the MFP A1 using a user terminal C via the

Internet B, and request the MFP A1 to transmit the stored document to the MFP A2 near the user. The MFP A2, in response to the request, transmits the designated stored document with a password to access
5 the stored document, to the designated MFP A2 via the Internet B. When the user inputs the password to the MFP A2, the MFP A2 prints the stored document.

According to another embodiment, the user operates an operations board of the MFP A1 (image
10 forming apparatus) that stores the stored document thereby to transmit the stored document to the MFP A2 (image forming apparatus) located at a place where the user is planning to visit. The MFP A1, in response to the operation, transmits the designated
15 stored document and the password for outputting the stored document to the designated MFP A2. When the user visits the place and inputs the password to the MFP A2, the MFP A2 outputs (print) the stored document.

20 FIG. 18 is a front view showing a multi functional full color digital copier (MFP) A1 shown in FIG. 17, as an embodiment of an image forming apparatus. The structure and functions of the MFP A2 is the same as those of the MFP A1. This multi
25 functional full color digital copier is an example of

the MFP according to the first through third embodiments described above.

The full color copier shown in FIG. 18 is configured by an automatic document feeder (ADF) 230, an operations board 220, a color scanner 210, a color printer 2100, and a paper feeding bank 235. A finisher 234 having trays in which stapled and/or printed pieces of paper is placed, a double-side print drive unit 233, and a large capacity paper feeding tray 236 are mounted on the printer 2100.

An image data processing apparatus ACP built in the MFP A1 (see FIG. 20) is connected to a LAN to which a PC is connected. A facsimile control unit FCU (see FIG. 20) is connected to a private branch exchange PBX connected to a telephone line PN (a facsimile communication channel). Printed paper output by the color printer 2100 is discharged to a paper discharging tray 2108 and the finisher 234.

FIG. 19 shows the structure of the color printer 2100. The color printer 2100 according to this embodiment is a laser printer. This laser printer 2100 is provided with four toner image forming units for forming images of magenta (M), cyan (C), yellow (Y), and black (K). The toner image forming units are arranged in this order along the

moving direction of transfer paper (the direction indicated as "y", that is, from the right bottom to the left top in FIG. 19). The laser printer 2100 is referred to as a four drum type full color image forming apparatus.

The toner image forming units are provided with photosensitive body units 2110M, 2110C, 2110Y, and 2110K having photosensitive body drums 2111M, 2111C, 2111Y, and 2111K, and development units 2120M, 2120C, 2120Y, and 2120K, respectively. The toner image forming units are disposed in the manner in which the rotative axes of the photosensitive body drums 2111M, 2111C, 2111Y, and 2111K are parallel to a horizontal x axis (the main scan directions), and the photosensitive body drums 2111M, 2111C, 2111Y, and 2111K are separated at a predetermined distance.

The laser printer 2100 is further provided with a laser exposure unit 2102, paper feeding cassette 2103, 2104, a resist roller pair 2105, a transfer belt unit 2106, a belt fixing type fixing unit 2107, a paper discharging tray 2108, a double side drive unit 233, for example. A transfer belt 2160 provided to the transfer belt unit 2106 holds transfer paper and carries the transfer paper through the transfer position of each toner image forming

unit. Although not shown, the laser printer 2100 is also provided with a hand feeder tray, a toner supply container, and trash toner bottle.

The laser exposure unit 2102 is provided
5 with a laser diodes 241M, 241C, 241Y, 241K, a polygon mirror, f-theta lenses, and reflective mirrors. The laser exposure unit 2102 scans the surfaces of the photosensitive body drums 2111M, 2111C, 2111Y, and 2111K in the x direction with laser beams based on
10 image data.

An alternate long and short dash line shown in FIG. 19 indicates a transportation path of transfer paper. A sheet of transfer paper fed by the paper feeding cassette 2103, 2104 is guided by a
15 transportation guide (not shown) and transported by a transportation roller to the resist roller pair 2105. The sheet of transfer paper is output to the transfer belt 2160 at a predetermined timing by the resist roller pair 2105. The transfer belt 2160 holds the
20 sheet of transfer paper and carries it through transfer positions of the toner image forming units.

Toner images formed on the photosensitive body drums 2111M, 2111C, 2111Y, and 2111K are transferred to the sheet of transfer paper
25 transported by the transfer belt 2160. The toner

images transferred to the sheet of transfer paper form a color image thereon. The sheet of transfer paper on which the color image is formed is transferred to the fixing unit 2107. This
5 transferring method is referred to as a direct transfer method as the toner images are directly transferred to the sheet of transfer paper. When the sheet of transfer paper passes the fixing unit 2107, the toner image is fixed on the sheet of transfer
10 paper. The sheet of transfer paper on which the toner image is fixed is discharged to the discharging tray 2108 or the finisher 236, or carried to the double side drive unit 233.

The yellow toner image forming unit is
15 described below. The toner image forming unit of the other colors are structured in the same manner as the yellow toner image forming unit. As described above, the yellow toner image forming unit is provided with the photosensitive body unit 2110Y and the
20 development unit 2120Y. Besides the photosensitive body drum 2111Y, the photosensitive body unit 2110Y is provided with a brush roller that paints lubricant on the surface of the photosensitive drum, a swingable blade that cleans the surface of the
25 photosensitive body drum, a discharging lamp that

radiates light to the surface of the photosensitive body drum, non-contact charging roller that uniformly charges the surface of the photosensitive body drum, for example.

5 The laser exposure unit 2102 modulates the laser beam L based on print data, deflects the modulated laser beam L with the polygon mirror, and scans the surface of the photosensitive body drum 2111Y with the deflected laser beam L thereby to form
10 an electrostatic latent image on the surface of the photosensitive body drum 2111Y. The electrostatic latent image formed on the photosensitive body drum 2111Y is developed by the development unit 2120Y thereby to form the yellow toner image. The yellow
15 toner image formed on the photosensitive body drum 2111Y is transferred to the sheet of transfer paper held on the transfer belt 2160 at the transfer position. After the toner image is transferred, the brush roller paints a predetermined amount of
20 lubricant on the surface of the photosensitive body drum 2111Y. The blade cleans the surface of the photosensitive body unit and the discharging lamp discharges the surface of the photosensitive body unit. The photosensitive body unit becomes ready for
25 forming a next electrostatic latent image.

The development unit 2120Y contains two component developer including magnetic carrier and negative charging toner. The development unit 2120Y is provided with a development roller, a stirring
5 screw, a doctor blade, a toner density sensor, and a powder pump, for example. The development roller is partially exposed from an opening provided at the side of photosensitive body drum on a development case 2120Y. The developer contained in the
10 development case is triboelectrified by stirring by the stirring screw. A portion of the developer is retained on the surface of the development roller. The doctor blade makes the layer of developer uniformly thick. Toner in the developer retained on
15 the surface of the development roller is transferred to the photosensitive body drum thereby to form a toner image corresponding to the electrostatic latent image on the photosensitive body drum 2111Y. The toner density sensor measures the density of toner in
20 the developer in the development case. If the density is too low, the powder pump is activated so as to supply additional toner.

The transfer belt 2160 of the transfer belt unit 2106 is suspended in a tensioned condition by
25 four grounded tension rollers in the manner in which

the transfer belt 2160 passes the transfer positions opposite the photosensitive body drums 2111M, 2111C, 2111Y, and 2111K, respectively. One of the four tension rollers is shown with a reference numeral 5 2109. A electrostatic absorption roller to which a predetermined voltage is applied by a power supply is disposed opposite one of the tension rollers (entrance roller) (pointed by an alternate long and two short dashes arrow) that is disposed at the 10 entrance of the sheet of transfer paper. The sheet of transfer paper passes between the above two rollers, and is electrostatically absorbed on the transfer belt 2160. An exit roller disposed at the downstream side is driven by a driver (not shown), and friction- 15 drives the transfer belt. A bias roller to which a predetermined voltage is applied from the power supply is disposed contacting the outer surface of the transfer belt 2160. The bias roller removes any alien substance such as attached toner from the 20 transfer belt 2160.

Transfer bias application members are disposed in the manner in which they contact the reverse surface of the transfer belt 2160 opposite the photosensitive body drum 2111M, 2111C, 2111Y, and 25 2111K. The transfer bias application member is a

fixed brush made of film such as Myler (trade mark).
A transfer bias voltage is applied to each transfer
bias application member from a transfer bias power
supply. The transfer bias application member applies
5 a transfer bias thereby to charge the transfer belt
2160. Accordingly, a predetermined amount of electric
field is formed between the transfer belt 2160 and
the photosensitive body drum at each transfer
position.

10 The sheet of transfer paper is transported
by the transfer belt 2160, and toner images formed on
the photosensitive body drums 2111M, 2111C, 2111Y,
and 2111K are transferred to the sheet of transfer
paper. The sheet of transfer paper is sent to the
15 fixing unit 2107. The toner image is heated,
pressurized, and fixed to the sheet of transfer paper.
After the toner image is fixed, the sheet of transfer
paper is sent to the finisher 234 through a discharge
opening 234ot or discharged to the discharging tray
20 2108 on the top of the printer 2100.

 The photosensitive body drums 2111M, 2111C,
and 2111Y are driven by a single electric motor
(color drum motor, not shown) via a power train and a
reduction gear (both not shown) with one step
25 slowdown. The photosensitive body drum 2111K for

forming black images is driven by another single electric motor (K drum motor, not shown) via a power train and a reduction gear (both not shown) with one step slowdown. The transfer belt 2160 is driven by a transfer drive roller driven by the K drum motor via a power train. Accordingly, the K drum motor drives the photosensitive body drum 2111K and the transfer belt 2160, and the color drum motor drives the photosensitive body drums 2111M, 2111C, and 2111Y.

10 The K development unit 2120K is driven by a electric motor (not shown) that drives the fixing unit 2107 via a power train and a reduction gear (not shown). The M, C, Y development units 2120M, 2120C, 2120Y are driven by an electric motor (not shown) via a power train and a reduction gear (not shown). The development units 2120M, 2120C, 2120Y, 2120K are not always driven. The above reduction gears control driving of the development units 2120M, 2120C, 2120Y, 2120K at predetermined timing.

20 FIG. 18 is referred to again. The finisher 234 is provided with a stacker tray (stack and down tray) 234hs and a sort trays 234st. The finisher 234 operates either in a stacker discharging mode in which the sheets of paper (printed paper, transferred paper) are discharged in the stack and down tray

25

234hs or in a sorter discharging mode in which the sheets of paper are discharged in the sort trays 234st.

A sheet of paper sent from the printer 2100
5 to the finisher 234 is carried in the top left direction, and then carrying direction is changed in the downward direction by an upside-down U shaped path. In the stacker discharging mode, the sheet of paper is discharged from a discharging opening to the
10 stack and down tray 234hs. In the sorter discharging mode, the sheet of paper is discharged to a sorter tray to which the sheet of paper is assigned.

When the sorter discharging mode is designated, a finisher discharge controller raises
15 the sort trays 234st set in a waiting position at the bottom to a use position indicated by an alternate long and two short dashes line thereby to separate the sorter trays.

The sorter discharging mode includes a set
20 sort mode and a page sort mode. In the set sort mode, each set of copied or printed paper is sorted in a sort tray 234st. That is, if multiple sets of documents are copied, for example, copied sets are discharged to respective sort trays 234st. In the
25 page sort mode, each tray is assigned to a page, and

multiple sheets of transfer paper on which the same image is printed are stacked in a sort tray.

FIG. 20 shows the structure of image processing system of the copier shown in FIG. 18. The color document scanner 210 including a scanning unit 312 and an image data output interface (I/F) 312 is connected to an image data interface control (CDIC) of the image data processing apparatus ACP. The color printer 2100 is also connected to the image data processing apparatus ACP. The color printer 2100 receives recording image data from an image data processing processor (IPP) of the image data processing apparatus ACP via a writing I/F 3134, and prints with an image forming unit 3135.

The image data processing apparatus ACP (hereinafter referred to as ACP) is provided with the following: a parallel bus Pb, a memory access control IMAC (hereinafter referred to as IMAC), a memory module MEM (hereinafter referred to as MEM) for storing images, a hard disk drive HDD (hereinafter referred to as HDD) as non-volatile memory, a system controller 21, RAM 34, non-volatile memory 35, Font ROM 36, CDIC, and IPP. A facsimile control unit FCU (hereinafter referred to as FCU) is connected to the parallel bus Pb. The operations board 220 is

connected to the system controller 31.

The scanning unit 311 of the color document scanner 210 for optically reading documents photo-optically converts reflective light from the document with a CCD provided on a sensor board unit SBU (hereinafter referred to as SBU) thereby to generate RGB image signal. The RGB image signal is converted into RGB image data by an A/D converter. The RGB image data is processed by shading compensation, and output to CDIC via the output I/F 312.

The CDIC mediates image data transfer among the color document scanner 210 (output I/F 312), the parallel bus Pb, and IPP, and further mediates communication between the process controller 3131 and the system controller 31 that control the entire system of the ACP. The RAM 3132 is used by the process controller 3131 as a work area. The ROM 3133 stores programs that are executed by the process controller 3131.

The memory access control IMAC (hereinafter referred to as IMAC) controls reading and writing of image data and control data to/from the MEM and the HDD. The system controller 31 controls elements connected to the parallel bus Pb. The RAM 34 is used by the system controller 31 as a work area. The

nonvolatile memory 35 stores programs that are executed by the system controller 31.

The operations board 220 gives the ACP operational instructions. For example, the operations
5 board 220 informs the ACP of the kind of processing (copying, facsimile transmission, image reading, and printing, for example) and the number of copies, for example. As described above, an operator can input image data control information with the operations
10 board 220.

The image data read by the scanning unit 311 of the scanner 210 is processed with shading adjustment by the SBU, and then further processed with scanner gamma adjustment and filter processing,
15 for example, thereby to adjust distortion caused by scanning. The adjusted image data is stored in the MEM or the HDD. When image data stored in the MEM or the HDD is printed, the RGB signal is converted into a YMCK signal by the IPP, and then, the YMCK signal
20 is processed with print gamma conversion, gray shade conversion, gray shade processing such as dithering or error diffusion processing. The processed image data is transferred from the IPP to the writing I/F 3134. The writing I/F 3134 controls the pulse width
25 and the power of laser beam based on the gray-scale

processed signal. The image data is transferred to the image forming unit 3135 that reproduces image on the transfer paper.

The IMAC controls the access to the image data stored in the MEM or the HDD, expands data transmitted from the personal computer PC (hereinafter referred to as PC) connected to the LAN for printing, and compress and decompress image data for efficient use of the memory capacity of the MEM and the HDD.

The image data transmitted to the IMAC is compressed and stored in the MEM or the HDD. The stored image data is retrieved, if necessary. The retrieved image data is decompressed thereby to reproduce original image data, and sent to the CDIC from the IMAC via the parallel bus Pb. The image data is further transferred from the CDIC to the IPP, and is processed with image quality processing. The processed image data is output the the writing I/F 3134. The image forming unit 3135 reproduces the image on the transfer paper.

The parallel bus Pb and the bus control by the CDIC realizes the multiple functions of the digital multiple functional peripheral. A facsimile transmission is realized by processing a scanned

image by the IPP and transferring the processed
scanned image to the FCU via the CDIC and the
parallel bus Pb. The FCU converts the image data into
facsimile data and transmits the facsimile data to
5 the public network PN. A facsimile reception is
realized by converting facsimile data received from
the public network PN into image data by the FCU and
transmitting the image data to the IPP via the
parallel bus Pb and the CDIC. In this case, no
10 special image quality processing is performed on the
image data. The writing I/F 3134 outputs the image
data, and the image forming unit 3135 reproduces the
image on transfer paper.

In the case that a plurality of jobs such
15 as the copying function, the facsimile
transmission/reception function, and the printer
output function are performed in parallel, the system
controller 31 and the process controller 3131
allocates the use rights of the scanning unit 311,
20 the image forming unit 3135, and the parallel bus Pb
to the jobs. The process controller 3131 controls the
flow of image data. The system controller 31 controls
the entire system, and controls the activation of
resources. Functions of the digital multi functional
25 peripheral is selected using the operational board

220. An operator can set the contents of processing such as the copy function and the facsimile function by inputting a selection to the operations board 220.

The system controller 31 and the process
5 controller 3131 mutually communicates via the parallel bus Pb, the CDIC, and the serial bus Sb. Specifically, the CDIC mediates the communication between the system controller 31 and the process controller 3131 by converting data format between the
10 parallel bus Pb and the serial bus Sb.

Various bus interfaces such as the parallel bus I/F 37, the serial bus I/F 39, the local bus I/F 33, and the network I/F 38 are connected to the IMA. The controller unit 31 is connected to related units
15 of the ACP via various busses so as to keep the controller unit 31 independent from them.

The system controller 31 controls the other functional units via the parallel bus Pb. The parallel bus Pb is also used for transferring the
20 image data. The system controller 31 causes the IMAC to store the image data in the MEM and the HDD by giving an operational control instruction. This operational control instruction is transferred via the IMAC, the parallel bus I/F 37, the parallel bus
25 Pb.

The CDIC, in response to the operational control instruction, sends the image data to the IMAC via the parallel bus Pb and the parallel bus I/F 37. The IMAC stores the image data in the MEM or the HDD.

5 When the PC requests the multi functional peripheral to function as a printer, the system controller 31 of the ACP functions as a printer controller, a network controller, and a serial bus controller. In the case that the request is
10 transmitted via the network B, the IMAC receives the request for printing data or the request for storing data via the network and the network I/F 38. The request (incoming command) received via the network B is informed to the system controller 31. The IMAC
15 transmits the data to be stored or stores the data in accordance to a command issued by the system controller 31 in response to the request.

In the case of a general purpose serial bus connection, the IMAC receives the print request data
20 via the serial bus I/F 39. The general purpose serial bus I/F 39 complies with a plurality of kinds of standards such as the Universal Serial Bus (USB), IEEE 1284, and/or IEEE 1394.

The print request data from the PC is
25 expanded by the system controller 31 into image data

in a memory are in the MEM. Font data needed for the expansion is provided by the Font ROM 36 via the local bus I/F 33 and the local bus Rb. The local bus Rb connects the controller 31 to the nonvolatile
5 memory 35 and the RAM 34.

Beside an external serial port 32 for the connection with the PC, there is an interface between the serial bus Sb and the operations board 220 that is an operations unit of the ACP. The operations
10 board 220 communicates with the system controller 31 via the IMAC, and accepts user's instruction and displays the state of the system.

The system controller 31, the MEM, the HDD, and the various buses communicates via the IMAC. Jobs
15 that use the MEM and the HDD are centrally controlled in the entire ACP.

FIG. 21 is a block diagram showing the circuit of the operations board 220. The operations board 220 is provided with the following: a liquid
20 crystal touch panel (hereinafter referred to as a liquid crystal display or display) 379, an operations key matrix 3271, and light emitting diode (LED) 3272. The liquid crystal display 379 has an input function as well as a display function. The key matrix 3271
25 has a power key that switches a power save mode

(sleeping mode or low power consumption mode) and a stand-by mode. When the power key is pressed once in the power saving mode, the mode is switched from the power saving mode to the stand-by mode. When the
5 power key is pressed once in the stand-by mode, the mode is switched from the stand-by mode to the power saving mode.

The control circuit of the operations board 220 shown in FIG. 21 includes the following: a CPU
10 3253, ROM 3265, RAM 3266, VRAM 3268, a liquid crystal display controller (LCDC) 3267, and a timer 3273. The CPU 3253 communicates with the MPU 361 of the system controller 31, reads the input to the operations board 220, and controls the display on the operations
15 board 220. The ROM 3265 stores the control programs of the CPU 3253. The RAM 3266 temporarily stores data. The VRAM 3268 stores the image data of the LCD 379. The liquid crystal display controller 3267 is connected to the VRAM 3268, and controls the timing
20 for imaging of the LCD 3260. The timer 3273 generates clock data. The LCD 3260 has a CFL light source as a backlight 3270 and is connected to the LCDC 3267. An inverter 3269 that drives the CDL backlight 3270, a key matrix 3271, an LED matrix 3272, and an LED
25 driver 373, for example, are connected to the CPU

3253.

A nonvolatile RAM (NVRAM) 3264 for storing image processing mode, state information, and use records is connected to the data bus to which the CPU
5 3253 is connected.

As shown in FIG. 22, the operations board 220 is provided, beside the liquid crystal touch panel 479, with the following: a ten key 480a, a clear/stop key 480b, a start key 480c, an
10 initialization setting key 480d, a mode clear key 480e, a test print key 480f.

When the test print key 480f is pressed, only a set of documents is printed despite the number of sets designated. The operator can check the result
15 of printing. The operator can customize the initial state of the system by pressing the initialization setting key 480d. The operator can set the paper size to be stored in the system, and set the state to which the system returns when the reset key is
20 pressed. When the initialization setting key 480d is pressed, a menu including "initial parameter setting" function for setting various initial parameters, "ID setting" function, "copy right registration/setting" function, and "use record outputting" function is
25 displayed. The operator can select an application

that is, if no operation is made for a predetermined time period, activated at a priority. It is possible to set the time for transiting to a low power consumption mode in compliance with the international energy star, and the time for transiting to auto off/sleep mode.

In the liquid crystal touch panel 479, messages indicating the state of various functional keys and the multi functional peripheral are displayed. Function selection keys 480g for selecting a function such as "copy" function, "scanner" function, "printer" function, "facsimile" function, "www transfer" function, "edit" function, "registration" function are also shown in the liquid crystal touch panel 479. An input/output screen corresponding to the function selected by the function selection key 480g is displayed in the liquid crystal touch panel 479. As shown in FIG. 22, when "copy" function is selected, for example, function keys 479a, 479b and messages indicating the number of sets and the state of the multi functional peripheral are displayed. When the operator touches a key displayed in the liquid crystal touch panel 479, the touched key turns to gray. If specific items needs to be set (the kind of page print, for example),

when the operator touches a key, the screen for setting the specific items is displayed. As described above, since a dot matrix display is employed as the liquid crystal touch panel 479, the system can
5 communicate with the operator through graphical user interface.

When the "www transfer" key 481 in the function selection keys 480g is pressed, or a command for transmitting a stored document is sent from the
10 user terminal C, the system controller 31 of the ACP, in cooperation with the IMAC, transmits the stored document. The transmission operation is explained with reference to FIG. 23.

When the "www transfer" key 481 is pressed
15 by a user, the system controller 31 displays an input screen for requesting the user to input a user code on the liquid crystal panel 479 of the operations board 220. When the user code is input, a determination is made whether the input user code is
20 registered (steps S201, S202).

If the input user code is registered, the system controller 31 displays an input screen for requesting for transfer set information (step S204). The transfer set information includes (1) address of
25 receiving apparatus (for example, the Internet

address of the MFP A2), (2) an output password that permits printing of the stored document, and (3) document registration code of the stored document (stored in the MEM or the HDD). When the above items
5 are input, the system controller 31 determines whether the inputted output password is correct by searching it in the passwords for outputting the stored document. The system controller 31 further determines whether there is a stored document in the
10 MEM or the HDD corresponding to the input document registration code (step S205-207). If both determinations are positive, the output password, the document registration code, and the stored document corresponding to the document registration code are
15 transmitted to the address of the receiving apparatus (step S208). The receiving MFP A2 (image forming apparatus) receives and stores the address of the transmitting apparatus (the Internet address of the transmitting MFP A1, for example), the output
20 password, the document registration code, and the stored document in the HDD of the ACP of the MFP A2.

When a command for transmitting a stored document from the user terminal C (step S209), the system controller 31 operates in the same manner as
25 the case that the "www transfer" key 481 is pressed.

In this case, however, an input screen is transmitted to the user terminal C instead of displaying the input screen on the liquid crystal touch panel 479 of the operations board 220, and input data is received
5 from the user terminal C instead of the user inputting data through the input screen.

When a receiving user inputs the output password into the MFP A2, the MFP A2 prints the stored document. The system controller 31 of the MFP
10 A2 operates in the same manner as the system controller 31 of the MFP A1. FIG. 24 is a flow chart showing print processing of the system controller 31 of the MFP A2.

When the "print" key 482 in the function
15 selection keys 480g in the liquid crystal touch panel 479 is pressed, the system controller 31 displays a print menu for requesting the user to select "user mode", "guest mode", and other modes in the liquid crystal touch panel 479 (steps S211, 212). If the
20 user selects "guest mode", the system controller 31 displays an input screen for requesting the user to input the output password in the liquid crystal panel 479 (steps S213, 214). In response to the input of the output password, the system controller 31
25 determines whether the inputted output password is

correct by searching the inputted output password in
the HDD of the ACP. If a determination is made that
the output password is correct, the system controller
31 reads the stored document corresponding to the
5 document registration code assigned to the correct
output password from the HDD, and prints the stored
document using the printer 2100 (step S216, 217).

After completing to print the stored
document, the system controller 31 displays a screen
10 for selecting the deleting or storing of the stored
document on the liquid crystal panel 479, and waits
for user's input (step S218, 219). If deleting is
selected, the system controller 31 deletes the stored
document and related information such as the output
15 password and the document registration code from the
HDD (step S220).

If the operator selects "user mode" from
the print menu, the system controller 31 displays
another print input screen and request the operator
20 to his/her user ID and related information. If the
operator is successfully identified as a registered
user of the MFP A2, the operator can print the stored
document using the user mode functions (step S221).

[FIFTH EMBODIMENT]

25 FIG. 25 shows an image forming system

according to a fifth embodiment of the present invention. It is noted that a network server D is additionally connected to the Internet B. The network server D is a server operated by an information
5 storage service provider or a contents provider, for example. The network server D stores files and data of customers, informs the customers that another file is stored, and transfers the stored file and data to addresses designated by the customers.

10 The hardware of the MFPs A1 and A2 (image forming apparatuses) is the same as the fourth embodiment shown in FIG. 17. The software of the MFPs A1 and A2 is almost identical to that of the fourth embodiment, but is different in that, since the
15 server D functions as a relay station among the MFP A1, the user terminal C, and the MFP A2, the communication operation of the MFPs A1 and A2 is slightly different from that of the fourth embodiment.

 The MFPs A1 and A2 are assumed to be multi
20 functional color copiers having the same structure and the same function that can mutually communicate via a local area network (LAN) and the Internet B. The MFPs A1 and A2 also can communicate with the user terminals C such as a personal computer PC, a
25 notebook PC, a personal digital assistant (PDA), and

a mobile phone. The structure and function of the MFPs A1 and A2, however, may be different as long as they can operate as described in this specification.

According to an embodiment, the MFP A1
5 stores documents (stored documents) such as image data acquired by a scanner and a digital camera, image data created by computer graphics and CAD, document data created by a word processor, and facsimile data. When a user needs to access a stored
10 document but is far from the MFP A1, the user accesses the MFP A1 using a user terminal C via the Internet B, and request the MFP A1 to transmit the stored document to the server D. The MFP A2, in response to the request, transmits the designated
15 stored document with the address of the user terminal C in the Internet B and an output password to access the stored document, to the server D via the Internet B. The server D, in response to reception of the stored document, the address of the user terminal C,
20 and the output password, registers the received data, and transmits the password to the user terminal C.

When a user inputs the output password and the address of the server D to the MFP A2, the MFP A2 transmits the output password to the server D. The
25 server D, in response to reception of the output

password, transmits a stored document related to the output password to the MFP A2. The MFP A2 prints the stored document received from the server D.

According to another embodiment, a user
5 operates an operations board of the MFP A1 (image forming apparatus) that stores the stored document thereby to transmit the stored document to the server D. The server D transmits the stored document to the MFP A2, and the MFP A2 outputs (print) the stored
10 document in the same manner as described above.

When the "www transfer" key 481 in the function selection keys 480g is pressed, or a command for transmitting a stored document is sent from the user terminal C, the system controller 31 of the ACP,
15 in cooperation with the IMAC, transmits the stored document. The transmission operation is explained with reference to FIG. 26.

When the "www transfer" key 481 is pressed by the user, the system controller 31 displays an
20 input screen for requesting the user to input a user code on the liquid crystal panel 479 of the operations board 220. When the user code is input, a determination is made whether the input user code is registered (steps S301, S302).

25 If the input user code is registered, the

system controller 31 displays an input screen for requesting for transfer set information (step S304a). The transfer set information includes (1) address of user terminal C, (2) an output password that permits
5 printing of the stored document, and (3) document registration code of the stored document (stored in the MEM or the HDD). When the above items are input, the system controller 31 determines whether the inputted output password is correct by searching the
10 inputted output password in the passwords for outputting the stored document. The system controller 31 further determines whether there is a stored document in the MEM or the HDD corresponding to the input document registration code (step S305-307). If
15 both determinations are positive, the address of the user terminal C, the output password, the document registration code, and the stored document corresponding to the document registration code are transmitted to the server D (step S308a).

20 FIG. 27 is a flow chart showing the receiving operation of the server D. The server D, in response to reception of the set information (the address of the user terminal C, the output password, and the document registration code) and the stored
25 document, registers the received information to an

HDD of the server D (steps S331, 332). The server D transmits the output password and the address of the server D to the user terminal C (step S333). The user terminal C stores the received information therein.

5 When a command for transmitting a stored document from the user terminal C (step S309), the system controller 31 operates in the same manner as the case that the "www transfer" key 481 is pressed. In this case, however, an input screen is transmitted
10 to the user terminal C instead of displaying the input screen on the liquid crystal touch panel 479 of the operations board 220, and input data is received from the user terminal C instead of the user inputting data through the input screen.

15 When a receiving user inputs the output password and the address of the server D into the MFP A2, the MFP A2 prints the stored document. The system controller 31 of the MFP A2 operates in the same manner as the system controller 31 of the MFP A1. FIG.
20 28 is a flow chart showing print processing of the system controller 31 of the MFP A2.

 When the "print" key 482 in the function selection keys 480g in the liquid crystal touch panel 479 is pressed, the system controller 31 displays a
25 print menu for requesting the user to select "user

mode", "guest mode", and other modes in the liquid
crystal touch panel 479 (steps S311, 312). If the
user selects "guest mode", the system controller 31
displays an input screen for requesting the user to
5 input the output password and the address of the
server D in the liquid crystal panel 479 (steps S313,
314a). In response to the input of the output
password and the address of the server D, the system
controller 31 transmits the output password to the
10 address of the server D (step S315, 316).

Referring to FIG. 27, the server D, in
response to the output password, transmits the
document registration code corresponding to the
received output password and the stored document to
15 the MFP A2 (step S334, 335).

Referring to FIG. 28 again, the system
controller 31 of the ACP of the MFP A2 prints the
stored document received from the server D (step S316,
317), and informs the server D of the completion of
20 printing the stored document (step S319):

Referring to FIG. 27 again, the server D,
in response to reception of information indicating
the completion of printing the stored document, sends
a query whether to delete the stored document
25 corresponding to the output password (steps S336,

337). If the user terminal C requests to delete the stored document, the server D deletes the set information and the stored document from the HDD (step S338, 339).

5 [VARIATION OF FIFTH EMBODIMENT]

According to the above fifth embodiment, the MFP A1, in response to user's operation, transmits an output password for accessing a stored document to the server D, and the server D transmits
10 the same output password to the user terminal C. However, the server D may generate an output password and transmit the generated output password to the user terminal C. In this case, the information item included in the set information can be reduced.
15 The transmitting user does not need to input the output password to the MFP A1. The operational flow of the server D is shown in FIG 29.

The server D, in response to reception of set information (the address of the user terminal C
20 and the document registration code) and the stored document, stores them in an HDD of the server D (step S331, 332). The server D generates an output password for accessing the stored document, and transmits the generated output password and the address of the
25 server D to the user terminal C (step S333a). The

user terminal C stores the output password and the address received from the server D. Since the remaining steps of the MFP A2 and the user terminal C are the same as those of the above fifth embodiment, 5 their description is omitted.

The present invention is not limited to these embodiments, but variations and modifications may be made without departing from the scope of the present invention.

10 This patent application is based on Japanese priority patent application No. 2002-260430 filed on September 5, 2002, and No. 2002-334007 filed on November 18, 2002, No. 2003-310252 filed on September 2, 2003, the entire contents of which are 15 hereby incorporated by reference.